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### REMARKS

This is in response to the Office Action of January 30, 2001 in which the finality was withdrawn in the communication mailed May 31, 2001. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

\* \* \* \* \*

On page 2 of the Office Action, claims 8-15 and 18-19 are rejected under 35 U.S.C. 112, second paragraph. In the explanation of the rejection, the Examiner states:

*"The general scope of the intended subject matter is not clear. The claims are drawn to a [sic] apparatus but applicant relies on the combination and subcombination of the operation of the apparatus. It is not clear if the applicant is relying on [sic] apparatus and the operation for prosecution of the invention. The examiner has taken into the consideration the present invention and has come to the conclusion that the applicant [sic] invention is pertaining to the apparatus."*

Initially, the Examiner is requested to clarify the following:

1) what is the "combination and subcombination of the operation of the apparatus"?

2) what is meant by the statement "it is not clear if the applicant is relying on the apparatus and the operation for prosecution of the invention"?

As indicated in the previous response, the preamble of the independent claims recites "A component mounting apparatus", and

the body of the claims sets forth a number of interrelated structural elements. Accordingly, there can be no question that the claims are directed to the apparatus.

Furthermore, Applicants repeat the assertion that there is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. In re Swinehart, 169 USPQ 226 (Fed. Cir. 1971). A functional limitation is often used in association with an element in order to define a particular capability or purpose that is served by the recited element. The inquiry to be made in determining whether a claim is definite under 35 U.S.C. 112, second paragraph, is whether those of ordinary skill in the art would understand what is being claimed. Amgen Inc. v. Chugai Pharmaceutical, Ltd., 18 USPQ2d 1016, 1030 (Fed. Cir. 1991). It is submitted that one of ordinary skill in the art would have no trouble understanding what is being claimed in the present claims, particularly in view of the fact that the claims are to be read in light of the specification.

Further, in the "Response to Arguments" section of the Office Action, the Examiner states:

*"In response to the applicant [sic] arguments that the functional language has mislead [sic] the examiner to interpret [sic] the claim as a method and apparatus is not found persuasive. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employ [sic] does not differentiate the claimed apparatus from the prior art apparatus*

*satisfying the claimed structural limitations. Ex parte Masham 2 USPQ2d 1647 (1987)."*

The Examiner is respectfully requested to explain the reliance on Ex parte Masham because it clearly has nothing to do with 35 U.S.C. 112, second paragraph.

The Masham case involves the effect of "intended use" language, i.e. a recitation with respect to the material intended to be worked upon by a claimed apparatus, in an anticipation rejection under 35 U.S.C. 102(b). Clearly, the cited case refutes rather than supports the Examiner's position because the Board found that the examiner factually determined that the prior art apparatus is capable of operating in accordance with the claimed apparatus. Further, the Board found that the Examiner's factual determination appeared to be based upon sound technical reasoning. Ex parte Masham, 2 USPQ2d 1647, 1648 (B.P.A.I. 1987). In other words, the Board agreed with the Examiner's treatment of the claim language which included a factual finding, based on sound technical reasoning, that the prior art apparatus was capable of operating in accordance with the claimed language.

In view of the above, the Examiner is requested to withdraw the rejection of claims 8-15 and 18-19 under 35 U.S.C. 112, second paragraph. Should the Examiner decide to repeat this rejection, then the Examiner is requested to identify the language that renders the claim unclear. The Examiner is also requested to

explain why the relevant issue isn't the limiting effect of the claim language as in Ex parte Masham. Further, the Examiner is requested to explain why he considers claims 8-15 and 18-19 to not be in compliance with the provisions of 35 U.S.C. 112, second paragraph, while he considers claims 20-28 to be in compliance with the provisions of 35 U.S.C. 112, second paragraph.

\* \* \* \* \*

Next, on pages 3-6 of the Office Action, the claims are rejected over the prior art as follows:

Claims 8-11, 13-15, 18-25, 27 and 28 are rejected over Dornes (U.S. Patent No. 4,573,262) in view of Japanese Reference No. 63-178596 (hereinafter JP '596);

Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dornes in view of JP '596 and further in view of the admission of prior art in the present application.

It is submitted that the present invention, as defined in the amended claims, now clearly patentably distinguishes over the collective teachings of Dornes, JP '596, and the prior art admission for the following reasons.

Independent claims 8, 18 and 24 each requires that each of the first and second mounting heads has a plurality of component suction nozzles for successively picking up components by suction at one of the component supply tables. The mounting heads can then move, with the sucked components, to a board that is positioned at

a board mounting position. After the mounting head has moved to the board mounting position, the mounting head is capable of successively mounting the sucked components on the board while moving in directions which are perpendicular to each other.

Thus, each of independent claims 8 and 24 requires first and second heads having the capability of picking up a plurality of components, and then moving to a different location to successively mount the sucked components. Furthermore, independent claim 18 requires first and second heads, with at least one having a plurality of component suction nozzles for successively picking up components by suction at one of the component supply tables.

Furthermore, by the above amendment, each of the independent claims requires that the first mounting head section is capable of mounting the plural picked-up components onto the board while the second mounting head section successively sucks to pick up the plural components at the other of the component supply tables. In general, when a first mounting head is moved between the component supply tables and the board mounting position and a second mounting head is attempting to suck or mount a component, large vibrations caused by movement of the first mounting head will likely interfere with the precision of the component mounting and sucking operations of the second mounting head. In the present invention, as defined in the amended claims, when a suction operation of the first mounting head is being performed, the second mounting head does not

move between the component supply tables and the board mounting position, which avoids the large vibrations that would be generated by the movement. Accordingly, in the present invention, the suction and mounting operations can be performed with a high degree of accuracy.

As discussed in the previous response, **Dornes** discloses heads 38 and 40, each of which is initially placed in a pick-up position where the head 38 or 40 picks up a single connector 56 (component). Then, the head 38 or 40 is moved to a predetermined position over the circuit board 8, where the pins 57 of the connector 56 are inserted into holes 58 of the board 8 (see col. 3, line 65 to col. 4, line 29). Furthermore, col. 4, lines 41-46 of Dornes states that:

"The connector insertion and pick-up tool 50 has at its working end 68, slots 70, defining legs 72 and the outer ones of which frictionally engage respective side walls 59A, of the housing 59 so that the tool can pick-up the connector 56 from its pick-up station, as the tool is raised."

In other words, Dornes discloses that the operation of picking up a single component 56 is achieved by frictional engagement of respective sides walls 59A of the housing 59 with the slots 70 and the legs 72 of the tool 50, as shown in Fig. 1A, without sucking the component, then the tool moves to a predetermined position over the circuit board 8, and then the pins 57 of the connector 56 are

inserted into holes 58 of the board. Thus, a single component pick-up step and a single insertion step are repeated sequentially. That is, Dornes merely teaches that an operation consisting of picking-up, moving, and mounting a single component is repeated successively. Therefore, it is clear that Dornes does not disclose or suggest a first mounting head section that is capable of successively sucking a plurality of the components with a plurality of component suction nozzles to successively pick-up the components at one of the component supply tables, thereafter moving the component suction nozzles to a board positioned at the board mounting position, and thereafter successively mounting the picked-up components on the board, while a second mounting head section successively picks up the plural components at the other of the component supply tables.

Furthermore, Dornes fails to disclose or suggest a component suction nozzle for sucking a component. That is, since a single component 56 is picked up with the frictional engagement of respective side walls 59A of the housing 59 with the slots 70 and the legs 72 of the connector insertion and pick-up tool 50, the connector insertion and pick-up tool 50 cannot pick up different kinds of connectors because a different kind of connector will have different housing side walls 59A, which cannot be frictionally engaged with the slots 70 and the legs 72 of the **same** connector



insertion and pick-up tool 50. However, in the present invention, the component suction nozzle can suck different components even though the component may be of a different size and thickness. Such a technique is clearly not possible with the Dornes apparatus.

Furthermore, it is again submitted that the Examiner has not properly construed the term "successively". That is, it appears that the Examiner considers that the meaning of "successively picking up the components ... and thereafter successively mounting the picked-up components on the board" can be read on "picking up a single component ... and thereafter successively mounting the picked-up component on the board". However, there are clear differences between these two descriptions. In particular, in the Dornes apparatus, only a single component is picked up and then mounted on the board. Therefore, Dornes, fails to disclose an apparatus that is capable of sucking a plurality of components, and then mounting the picked-up components. Specifically, in Dornes, when two components are to be picked-up and mounted on a board, a first component is picked up and then mounted on a board, and then a second component is picked up and mounted on the board. In contrast, in the present invention, the apparatus is capable of "successively" picking-up first and second components by suction (that is, all of components to be mounted are sucked), and then successively mounting the first and second components on a board. Note that the dictionary definition of successive is "*following in*

*uninterrupted order; consecutive*". Accordingly, the term "successively" precludes an arrangement which mounts two components by picking up and mounting the first component prior to picking up the second component.

Also, please note that in Dornes, since the respective side walls 59A of the housing 59 of the connector are frictionally engaged with the slots 70 and the legs 72 of the connector insertion and pick-up tool 50 to pick up a single component 56, when a different kind of connector having a housing with different side walls is picked up by the head, the connector insertion and pick-up tool 50 of the head must be replaced with another connector insertion and pick-up tool having different slots and legs. Therefore, different kinds of components cannot be successively picked up with the Dornes pick-up tool.

**JP '596** is cited by the Examiner to teach a mounting apparatus having a plurality of nozzles that are movable in first and second directions.

The Examiner apparently asserts that it would have been obvious to modify the Dornes apparatus with the mounting heads of JP '596. However, Further, in col. 1, lines 34-38, Dornes states that an object of the Dornes invention is to "provide apparatus for force fitting components into a workpiece, which apparatus is

capable of delivering very substantial insertion forces and which is at the same time relatively rapid in operation." Accordingly, it is submitted that the use of the mounting heads of JP '596 in the Dornes apparatus would destroy the intended purpose thereof. Therefore, the combination proposed by the Examiner would not have been obvious under 35 U.S.C. 103.

In view of the above, it is submitted that the collective teachings of Dornes and JP '596 fail to disclose or suggest a component mounting apparatus having a first mounting head section capable of successively sucking plural components and **thereafter** successively mounting the plural picked-up components on a board, while a second mounting head section successively picks up the plural components at the other of the component supply tables.


In view of the above, it is submitted that claims 8-15 and 18-28 are clearly allowable over the prior art of record. The Examiner is therefore requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's

undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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[98-0077]

IN THE CLAIMS:

Kindly amend the claims as follows:

8. (Four Times Amended) A component mounting apparatus comprising:

a pair of component supply tables for accommodating a plurality of components, said component supply tables being arranged on opposite sides of a board mounting position;

a first mounting head section having a plurality of component suction nozzles for successively sucking to pick up the plural components at one of the component supply tables, thereafter moving to a board positioned at the board mounting position, and thereafter successively mounting the plural picked-up components onto the board while moving in first and second directions which are perpendicular to each other,

wherein the first direction is perpendicular to a direction in which the board is transferred, and the second direction is located along the board transfer direction; and

a second mounting head section having a plurality of component suction nozzles for successively sucking to pick up the plural components at the other of the component supply tables, thereafter moving to the board positioned at the board mounting position, and thereafter successively mounting the plural picked-up components onto the board while moving in third and fourth directions which are perpendicular to each other,

wherein the third direction is parallel to the first direction, and the fourth direction is parallel to the second direction but is not necessarily the same as the second direction,

wherein each of the first and second mounting head sections is independently moveable between the component supply table and the board, and the first mounting head section is capable of mounting the plural picked-up components onto the

board while the second mounting head section successively sucks to pick up the plural components at the other of the component supply tables.

18. (Amended) A component mounting apparatus comprising:

a pair of component supply tables for accommodating a plurality of components, said component supply tables being arranged on opposite sides of a board mounting position;

a first mounting head section for successively picking up the plural components at one of the component supply tables and thereafter successively mounting the plural picked-up components onto a board, positioned at the board mounting position, while moving in first and second directions which are perpendicular to each other,

wherein the first direction is perpendicular to a direction in which the board is transferred, and the second direction is located along the board transferred, and the second direction is located along the board transfer direction; and

a second mounting head section for successively picking up the plural components at the other of the component supply tables and thereafter successively mounting the plural picked-up components onto the board, positioned at the board mounting position, while moving in third and fourth directions which are perpendicular to each other,

wherein the third direction is parallel to the first direction, and the fourth direction is parallel to the second direction but is not necessarily the same as the second direction,

wherein each of the first and second mounting head sections is independently movable between the component supply table and the board,

wherein one of the first and second mounting head sections has a plurality of component suction nozzles for sucking

a plurality of the components prior to a component mounting operation,

wherein the first mounting head section mounts the plural picked-up components onto the board while the second mounting head section successively sucks to pick up the plural components at the other of the component supply tables.

24. (Amended) A component mounting apparatus comprising:  
a pair of component supply tables for accommodating a plurality of components, said component supply tables being arranged on opposite sides of a board mounting position;  
a first mounting head section having a plurality of nozzles for successively picking more than one of the components at one of the component supply tables and thereafter successively mounting the picked-up components on a board that is positioned at the board mounting position, said first mounting head section being movable in first and second directions which are perpendicular to each other,

wherein the first direction is perpendicular to a direction in which the board is transferred, and the second direction is along the direction in which the board is transferred; and

a second mounting head section having a plurality of component suction nozzles for successively picking up more than one of the components at the other of the component supply tables and thereafter successively mounting the picked-up components on the board, positioned at the board mounting position, while moving in third and fourth directions which are perpendicular to each other,

wherein the third direction is perpendicular to a direction in which the board is transferred, and the fourth direction is along the direction in which the board is transferred;

wherein each of the first and second mounting head sections is independently movable between the component supply tables and the board,

wherein the first mounting head section is capable of mounting the plural picked-up components on the board while the second mounting head section successively picks up the plural components at the other of the component supply tables.